SUPERFUND PROGRAM
PROPOSED PLAN

U.S. ENVIRONMENTAL PROTECTION AGENCY REGION 7

FINDETT/HAYFORD BRIDGE ROAD SITE
AMEREN MISSOURI HUSTER ROAD SUBSTATION
OPERABLE UNIT 4
ST. CHARLES, MO 63303

JANUARY 2021

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for the Ameren Missouri Huster Road Substation (Operable Unit 4 (OU4)) of the Findett/Hayford Bridge Road Site (Site), also known as the "Findett Corporation Site", identifies the U.S. Environmental Protection Agency's Preferred Alternative for OU4, and provides the basis for this preference. This Proposed Plan was developed by the EPA, the lead agency, in consultation with the Missouri Department of Natural Resources (MDNR), the support agency. The EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

This Proposed Plan summarizes information that can be found in greater detail in the Final Remedial Investigation Report, Feasibility Study, and other documents contained in the Administrative Record file for OU4. The EPA and MDNR encourage the public to review these documents to gain a more comprehensive understanding of the Ameren Missouri Huster Road Substation and the Superfund activities that have been conducted.

This Proposed Plan is being provided to inform the public of the EPA's Preferred Alternative and to solicit public comments pertaining to all the remedial alternatives evaluated, including the Preferred Alternative. The Preferred Alternative for OU4 is Alternative 3: Enhanced In-Situ Bioaugmentation Attenuation, Groundwater Extraction and Treatment, and Institutional Controls.

The EPA, in consultation with MDNR, will select a final remedy for OU4 after reviewing and considering all information submitted during the 30-day public comment period. The EPA, in consultation with MDNR, may modify the Preferred Alternative or select another remedial alternative presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all alternatives presented in this Proposed Plan.

MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
February 2, 2021 through March 1, 2021

The EPA will accept written comments on the Proposed Plan during the public comment period. Written Comments should be addressed to:

Clint Sperry
U.S. EPA, Region 7
11201 Renner Blvd
Lenexa, Kansas 66219
sperry.clint@epa.gov

The virtual online public meeting will explain the Proposed Plan and all the proposed remedial alternatives. Oral and written comments will be accepted at the meeting. This meeting will be held via Microsoft Teams.

Date: February 9, 2021
Time: 6:00 pm – 7:00 pm
Phone Number: 913-608-8349
Conference Code 865 294 622#

The EPA will announce the details of the public meeting by issuing a public notice and placing an ad in the local newspaper. You can find links to the Proposed Plan and the supporting documents in the Site's Administrative Record on our website.

SITE BACKGROUND

The Site originally came to the EPA's attention in the late 1970s when Findett Services Corporation (Findett) reported handling polychlorinated biphenyls (PCBs). During an EPA inspection, an unlined "quench pond" was identified on the boundary between the properties owned by Findett and an affiliated company, Cadmus Corporation (Cadmus). Findett utilized the quench pond by releasing hot residues into it from its recycling processes. In 1977 and 1981, Findett excavated the pond and disposed of the contaminated soils offsite. The PCB contamination in the surface soils was the primary concern in those early years of activity at the Site. Subsequent investigations identified that volatile organic compound (VOC) contamination existed in the subsurface soils and groundwater.

In 1984, the EPA proposed the Site for inclusion on the National Priorities List (NPL) of hazardous waste sites, mainly due to the potential exposure of contaminated groundwater to the nearby Elm Point Wellfield, which is a drinking water source for the City of St. Charles (City). The proposal was later withdrawn due to potential overlapping jurisdiction with the EPA's Resource Conservation and Recovery Act (RCRA). However, a Record of Decision (ROD) and corresponding Consent Decree with Findett were in place before the withdrawal. As a result, the EPA has continued to manage the Site as an "NPL-caliber" site using Superfund authority. Management of an NPL-caliber site follows the same Superfund process as a site on the NPL, without the access to federal funding.

The Site is divided into four OUs (see attachment 1):

- OU1 addresses the soil and groundwater contamination on the Findett property;
- OU2 addresses the soil contamination on the former Cadmus property;
- OU3 addresses affected groundwater that has migrated off the OU1/OU2 property boundaries; and
- OU4, the subject of this Proposed Plan, addresses source material and groundwater at the Ameren Missouri Huster Road Substation (Substation).

In June 2010, *cis*-1,2-dichloroethene (*cis*-DCE) was detected in City Well 5 of the Elm Point Wellfield, located approximately 180 feet north of the Substation boundary. Between 2011 and 2015, a group of potentially responsible parties (PRPs) performed additional investigations and response actions to address this contamination. Based on the analytical data collected by the PRPs in 2011, as well as independent testing by Ameren Missouri (Ameren) in 2012, the EPA identified the Substation as a separate and distinct source of contamination contributing significantly to the contamination in the Elm Point Wellfield.

The Substation, located at 3800 Huster Road, St. Charles, Missouri 63301, is an active electrical distribution and transmission substation. The substation was originally constructed in 1963 and with subsequent expansions now encompasses approximately 8 acres. The Substation property contains a control house, three transformers, two capacitor banks, and associated equipment, including a copper grounding grid embedded within crushed limestone. The Substation is surrounded by a twelve-foot flood protection berm and is fenced.

The Substation, situated within the Missouri River alluvial valley, is adjacent to the Elm Point Wellfield, specifically City Wells 4 and 5. City Wells 6, 7, and a radial well, City Well 9, are located north of the Substation. The newly installed City Well 10 is east of the Substation.

Ameren previously used a chlorinated solvent for degreasing and metal cleaning at the Substation. The solvent was manufactured by Mozel Chemical Company and contained approximately 18% tetrachloroethylene (PCE) and mineral spirits.

On December 28, 2012, the EPA and Ameren entered into a Settlement Agreement and Administrative Order on Consent (2012 AOC) to:

- Perform soil and groundwater sampling at the Substation to determine to what extent the Substation property is a source of contamination contributing to the existing OU3 groundwater plume;
- Contain and treat contaminated groundwater migrating off the Substation property; and

- Evaluate future remedial and removal actions.

Based upon the results of the investigations, Ameren implemented a series of pilot studies that evaluated several soil and groundwater treatment options and installed a groundwater extraction and treatment system (GETS) along the northern border of the Substation property.

On January 2, 2018 the EPA, Ameren, and MDNR entered into an Administrative Settlement Agreement and Order on Consent (2018 ASAOC) to complete the CERCLA process to document the remedial investigation and feasibility study Ameren had already completed. The remedial investigation report was finalized on May 1, 2019. The feasibility study report was finalized on March 2, 2020.

SITE CHARACTERISTICS

Land in the vicinity of the Substation is industrial, commercial, recreational, and residential. Fountain Lakes Park abuts the Substation to the north, east, and south. The park includes walking trails, a skateboard park, and several lakes or ponds that are used for fishing. Highway 370 runs along the north side of the park. A residential development is located southeast of the park. An industrial area is located across Highway 370 and Huster Road to the west of the Substation. Agricultural land is located south of the park, and south and north of the industrial area. North and west of Highway 370 is continued agricultural land and additional industrial-commercial property. Future land use is anticipated to remain the same.

Site geology consists of a granular surface of limestone rock and sand. This composition is 1-3 feet of rock with a copper grounding cable grid lying within. Beneath the transformer grid is a natural clay/silty clay material (cohesive unit) approximately 28-32 feet thick. Underlying the cohesive unit is a sand material to an anticipated depth of 110 feet to limestone bedrock contact. The unconsolidated materials above the limestone are a part of the flood plain of the Mississippi River, located approximately 2.8 miles north of the Site. Beneath each Substation transformer, as part of the Substation facility construction, a sump extends to a depth of 8-10 feet below ground surface (bgs) over an area slightly larger than the transformer coverage. This sump is filled with 3-4 inches of limestone rock.

Measuring of groundwater elevations at various times indicates a consistent flow direction to the north-northwest with a typical hydraulic gradient of 0.001 ft/ft, which equals roughly 1 ft/day.

Chlorinated solvents were historically used at the Substation for degreasing and metal cleaning. VOCs, primarily consisting of PCE, trichloroethylene (TCE), *cis*-DCE, and vinyl chloride (VC) have been detected in soil and groundwater at the Substation. In addition, chlorinated VOCs (primarily *cis*-DCE and VC) have been detected in groundwater to the north of the Substation. In June 2010, VOCs that were potentially Site-related were detected in City Well 5, which as noted above is located approximately 180-200 feet north of the Substation.

The source of PCE contamination and its degradation products at OU4 is the historic use of the product Mozel, which contained 18% PCE. It was used to clean oily surfaces prior to maintenance of Substation equipment. The initial investigation of OU4 identified the presence of VOCs onsite near electrical equipment, in both the soil and groundwater, with the highest concentrations being near the Substation's transformer number 2 (Transformer 2).

Soil

During the initial investigation of OU4, a total of 44 soil borings were taken at the Substation. The soil was logged consistently as silty clay to a depth of 34 feet where it transitioned to a fine to medium-grained alluvial sand. All borings remained in this sand unit to depths up to 104 feet.

During the 2012 investigation of OU4, PCE, TCE, *cis*-DCE, and VC were detected in soil at concentrations as high as 159,000 micrograms per kilogram (µg/kg), 14,200 µg/kg, 9,540 µg/kg, and 229 µg/kg respectively.

Groundwater

In 2012, a total of 44 groundwater samples were profiled to various depths. Groundwater profiling was performed from a depth of 33-37 feet bgs to a

depth of 103-107 feet bgs (the bedrock surface at the bottom of the alluvium). Samples were obtained at 10-foot intervals. There was no indication of dense non-aqueous phase liquid at the Substation.

Between 2013 and 2015, a total of 17 monitoring wells were installed at the Substation, three of which are screened in shallow perched groundwater zones at three different depths around Transformer 2 (see attachment 2).

Additional investigations further delineated the extent of VOCs in groundwater at the Site. Based on that investigation, the extent of groundwater contamination above the Safe Water Drinking Act maximum contaminant level (MCL) was limited to a depth of 45 feet bgs, except at one location where the MCL for PCE, 5 µg/L, was exceeded at depths of 53-87 feet bgs.

Pilot Study #1

The initial pilot study was conducted inside the Substation in March 2014 and evaluated the potential performance of three different in-situ remediation technologies in limited areas near electrical equipment at the Substation: zero valent iron (ZVI), potassium permanganate, and bio-augmentation. Within five months following the injection of potassium permanganate into three groundwater wells and at different soil depths near Transformer 2 and its sump, PCE and TCE concentrations in shallow groundwater decreased by 50 – 96%.

Decreases in PCE and TCE concentrations in groundwater were also observed following the injection of enhanced carbon ZVI into areas of elevated soil concentrations. Also, as a result of the biomass injection in groundwater downgradient of Transformer 2, significant reductions in contaminant concentration levels were observed, with PCE and TCE levels below detection limits, *cis*-DCE below its MCL and VC slightly above its MCL.

Pilot Study #2

To evaluate and address impacted groundwater located north of the Substation (referred to as the "Northern Plume"), Ameren conducted a second pilot study in November 2014 and April 2015. The second pilot study included an injection of enhanced ZVI in groundwater north of City Well 5 and south of Highway 370, sodium persulfate injections in groundwater wells near City Well 5, and injection of sodium permanganate into the clay soil layer inside the levee area of the Site in areas of highest COC concentrations near Transformer 2.

Within one year of the installation of ZVI permeable barriers, groundwater samples at monitoring well PZ-10 (the remaining monitoring well downgradient of the ZVI permeable barriers on the south side of Highway 370) were below the MCLs for all contaminants of concern (COCs). In addition, as of December 2015, sampling data from monitoring well PZ-2 (north of Highway 370) was below the MCL for *cis*-DCE and VC, and VC was only slightly above the MCL in two quarters (see Appendix D). Currently, monitoring well PZ-2 is below the MCL for all COCs.

Following the injection of sodium persulfate around City Well 5, COC concentrations were reduced to below MCLs within eight months. There has been no rebound in concentration levels, and sampling data from monitoring wells near City Well 5 continue to be below the MCLs, with the majority of sampling data in this area below detection limits for COCs.

In the second pilot study, sodium permanganate was applied to soil near Transformer 2 and in other areas to aggressively oxidize and significantly reduce COC concentrations and to limit the potential for further leaching into groundwater.

Pilot Study #3

In October 2016, Ameren conducted a third pilot study focused on the areas of maximum concentrations of COCs near Transformer 2 and along the center of the Substation. This pilot study expanded the biomass size injected into groundwater during the original pilot study to include groundwater below Transformer 2, the center of the substation, and areas north of the electrical distribution equipment.

Within seven months following the augmentation injections, sampling data from monitoring wells MW-10, MW-11, and MW-12, which are immediately downgradient of MW-8 and MW-13 that exhibited the highest concentrations of COCs, had no detections of COCs. In addition,

concentration levels of *cis*-DCE were reduced by 33% at MW-8 and 40% at MW-13. The VC concentrations at these locations have increased slightly, which is a positive indication of reductive dechlorination.

Pilot Study #4
Based upon the results from prior studies, in August 2018, Ameren performed a fourth pilot study to address concentrations of COCs in the groundwater surrounding MW-8, MW-9, MW-13, and MW-14, as well as the residual COC concentrations in soils surrounding these monitoring wells and Transformer 2.

Bioaugmentation agents were injected into MW-8 and MW-13 to enhance reductive dechlorination and to feed the existing biomass near MW-11 and MW-12. Additional bioaugmentation agents were also injected in MW-9 and MW-14, as well as IP-42, IP-45, and IP-46, as the previous quarters showed increasing COC concentrations, which may be indicative of continued mass flux of contaminants from soil to groundwater.

Soil samples were collected prior to the injection of sodium permanganate into the soils which demonstrated greatly reduced concentrations of COCs from 2012 levels. The highest concentrations of COCs found were 3,860 µg/kg for *cis*-DCE; 1,170 µg/kg for VC; 94 µg/kg (estimated) for PCE; and 28 µg/kg (estimated) for TCE. During the fourth pilot study, these higher concentration areas were targeted with additional injections of sodium permanganate to further oxidize the COCs; however, the amount injected was limited due to surfacing of oxidants after reaching maximum injection loading.

Nature and Extent of Contamination (Post-Pilot Studies)

Soil – Soil concentrations of target compounds were reduced following the application of treatment technologies used during the various pilot studies. Post treatment sampling data reflects a decrease of COC concentrations following the injection of both potassium and sodium permanganates into the silty clays.

Although COCs had been identified in the pre-remedial Substation soil (2-10 feet bgs and 10-23 feet bgs), no COCs were identified in the post-pilot studies substation soil above the EPA's industrial soil regional screening levels (RSLs).

In addition, no COCs were identified in post-pilot studies Substation soil (2-10 feet bgs) using residential RSLs. VC was identified as a COC in post-pilot studies Substation soil (10-23 feet bgs) due to one exceedance of the residential RSL at a depth of 20.5 feet bgs. However, there are no complete exposure pathways to soil greater than 20 feet bgs. Human Health Risk Assessments typically limit exposure to more shallow soil, because people are unlikely to come into contact with soil deeper than 15 feet. As stated above, the one exceedance of VC is above the EPA's residential soil RSL of 0.059 mg/kg, which is based on a lifetime excess cancer risk of 1×10^{-6} (one in one million); however, it does fall within the EPA's target risk range of 1×10^{-6} to 1×10^{-4} (one in ten thousand), for a potential future residential land use scenario. Using the post-pilot studies data, no other compounds were identified as COCs in soil.

Groundwater – The operation of the GETS has been effective in keeping COCs at OU4 from migrating into the former groundwater plume area north of the OU4. In addition, the onsite pilot studies have been effective in reducing the COC concentrations in the groundwater in a short period of time.

The successive treatments applied during the pilot studies have resulted in significant reductions of groundwater contamination and the ongoing reductive dechlorination of COCs. Current COCs in groundwater are 1,1-dichloroethene, acetone, *cis*-DCE, PCE, toluene, *trans*-1,2-dichloroethene, TCE, and VC. Of the seventeen monitoring wells on-site, one well is slightly above the MCL for TCE; two wells exceed the MCL for *cis*-DCE (7,300 µg/L and 12,000 µg/L); and at eight monitoring wells, VC ranged from 3.4 µg/L to 1,900 µg/L. The current area with COC concentrations above MCLs is limited to a small area surrounding Transformer 2. This is an improvement from pre-remedial concentration levels when only two monitoring wells were below the MCLs for all COCs.

SCOPE AND ROLE

OU4 is the last of four operable units at the Site to be addressed through the remedial process. The proposed remedial action at OU4 will prevent current and future exposure to contaminated groundwater. The exposure will be controlled through a combination of treatment and monitoring of contaminated groundwater and institutional controls.

SUMMARY OF SITE RISKS

Currently, OU4 is an active electrical power substation with restricted access. Future land use is not expected to change. Potential human receptors include current and future industrial workers who maintain the Substation and future construction workers who may perform upgrades or modifications involving subsurface excavation.

Groundwater north of the levee is currently used as a source of drinking water for public water supply. No COCs have been detected in the City Wells since February 2016. Installation of private supply wells in the area north of the levee is prohibited by local ordinance. Groundwater beneath the Substation remains contaminated with chlorinated solvents, some above their respective MCLs. Concentrations of *cis*-DCE and VC are as high as 12,000 µg/L and 1,900 µg/L respectively.

There are no occupied structures at the Substation and currently no structures in close proximity to groundwater where COCs have been detected. Thus, the vapor intrusion pathway is currently incomplete.

A Human Health Risk Assessment (HHRA) was completed in March of 2019. The HHRA evaluated current and potential threats to human health posed by exposure to contaminants in soil and groundwater, in the absence of any remedial action. The HHRA provides the basis for determining if remedial action is warranted and supports the evaluation of the remedial alternatives for OU4. A Screening Level Ecological Risk Assessment (SLERA) was conducted and it concluded that the ecological risks at OU4 were low. Specifically, the SLERA stated that potential adverse risks to aquatic or terrestrial receptors exposed to contaminants at OU4 are unlikely and that contaminated groundwater from OU4 does not appear to be negatively impacting ecological receptors.

The results of the HHRA support the following conclusions:

- Soil: Post-pilot studies currently show soil concentrations are below the EPA's RSLs for receptors that would reasonably be expected to access an active electrical power substation (industrial workers and construction workers). Furthermore, post-pilot studies show that soil concentrations are below residential RSLs. Because the concentrations are below industrial RSLs and are within the EPA's target risk range of 1×10^{-6} (lifetime excess cancer risk of one in one million) to 1×10^{-4} (lifetime excess cancer risk of one in ten thousand) for a potential future residential land use scenario, no further remediation of soil is necessary to mitigate health risks associated with direct exposures to Substation soil now or in the future.

Soil – Industrial

COC	RSL – µg/kg
PCE	39,000
TCE	1,900
cis-DCE	230,000
VC	1,700

Soil – Residential

COC	RSL – µg/kg
PCE	8,100
TCE	410
cis-DCE	1,600
VC	59

- Groundwater: There are currently no complete exposure pathways to groundwater beneath the Substation, so there are no unacceptable health risks under current use conditions. However, under a future residential exposure scenario, potable use of groundwater at the Substation poses an excess lifetime cancer risk of 2×10^{-1} (meaning that an individual experiencing the reasonable maximum exposure estimate has a two in ten chance of developing cancer as a result of Site-related exposure), which exceeds acceptable levels established in the NCP, and a

non-cancer hazard index (HI) of 950, which exceeds the target HI of 1 (an HI greater than one indicates that site-related exposures may present a risk to human health). These levels indicate significant potential health risks from future exposure to contaminated groundwater at OU4 and warrant remedial action. Groundwater COCs that primarily contributed to these risks of cancer and non-cancer health effects include PCE, TCE, *cis*-DCE, *trans*-1,2-dichloroethene, and VC.

Groundwater

COC	RSL – µg/kg
PCE	39,000
TCE	1,900
cis-DCE	230,000
VC	1,700

- Vapor Intrusion: The shortest distance between the leading edge of the contaminated groundwater plume and the nearest existing occupied building is approximately 300 feet (building located to the north of Highway 370). Therefore, the vapor intrusion pathway is not currently complete. However, VOCs were detected in substation groundwater at concentrations above the EPA's Vapor Intrusion Screening Levels (VISLs), indicating that the vapor intrusion pathway could be potentially complete if occupied buildings were constructed within the source area in the future.

It is the lead agency's current judgment that the Preferred Alternative identified in this *Proposed Plan*, or one of the other active measures considered in the *Proposed Plan,* is necessary to protect public health or welfare and the environment from actual or threatened releases of hazardous substances at the Site.

REMEDIAL ACTION OBJECTIVES

CERCLA, as amended by Section 121(b) of the Superfund Amendments and Reauthorization Act (SARA), requires selection of remedial actions to attain a degree of cleanup that ensures protection of human health and the environment, are cost effective, and use permanent solutions and alternative treatment technologies or resource technologies to the maximum extent practicable. To satisfy CERCLA requirements, remedial action objectives (RAOs) were developed for this proposed OU4 remedy. The RAOs were used to develop the remedial alternatives for OU4.

The RAOs developed for groundwater are:

- Prevent exposure to the COCs above their MCLs in groundwater;
- Prevent potential future risks to human receptors from inhalation of groundwater COCs via the vapor intrusion pathway;
- Prevent future migration of groundwater contamination off-Site; and
- Restore groundwater to beneficial use (i.e., at or below MCLs) within a reasonable timeframe.

Actions performed under the 2012 AOC, the 2018 ASAOC, or voluntarily by Ameren have resulted in attaining the RAOs for groundwater north of the Substation and have made significant progress towards those goals within the Substation. The RAO for soil has been achieved as described in the previous section.

SUMMARY OF REMEDIAL ALTERNATIVES

A summary of remedial alternatives to address risks to human health and the environment and to achieve remediation goals are as follows:

1. No Action;
2. In-Situ Chemical Oxidation (ISCO), Enhanced Bioaugmentation Attenuation (Enhanced Bio), GETS, and Institutional Controls (ICs); and
3. Enhanced Bio, GETS, and ICs.

The EPA recommends Alternative 3 for the reasons discussed herein.

Alternative 1 – No Action

The "no action" alternative provides a baseline reference to evaluate other alternatives. A no further action approach maintains the Site in its current condition without additional measures to control exposures.

This alternative includes leaving the Site as-is, with no additional response actions performed. While a no action alternative is applicable to areas of the Site where MCLs are not exceeded, it is the application of this alternative to the groundwater beneath a limited area of the Site that is evaluated here.

The City relies on groundwater for its water supply needs and the Site is located within the City's well field. Accordingly, this alternative is not effective in providing protection to human health and the environment and will not reduce the toxicity, mobility, or volume (TMV) of the COCs. This alternative would not meet the RAOs.

Capital Cost	$0
Annual Operation & Maintenance (O&M)	$0
Present Worth Cost	$0
Time to Meet RAOs	>30 years

Alternative 2 – ISCO, Enhanced Bio, GETS, and ICs

ISCO involves the injection of at least one oxidant to chemically break down the COCs to produce non-toxic end products. As part of the pilot test studies, Ameren considered a variety of oxidant products. Both potassium and sodium permanganate were evaluated.

Ameren conducted three pilot studies to assess the effectiveness of chemical oxidation. While such measures proved effective, care must be taken so that the chemical reactions are exercised to completion so as not to produce toxic end products, such as VC. In fact, according to the HHRA, the soil has reached both industrial and residential RSLs and no additional measures are necessary to mitigate health risks associated with potential exposures to Substation soil. The pilot studies have shown that chemical oxidation using permanganates (sodium or potassium) has been successful in the reduction of the COCs in the clay soils at OU4.

Enhanced bio is defined as the use of dehalococcoides (chlorinated-solvent-degrading bacteria) to enhance existing natural attenuation processes in groundwater. This alternative consists of a carefully controlled and monitored site cleanup approach that will reduce contaminant concentrations in groundwater to levels that are protective of human health and the environment within a reasonable timeframe. Enhanced bio includes the physical, chemical, and biological processes that reduce the mass, toxicity, mobility, volume, or concentration of contaminants. This requires extensive monitoring, data evaluation and risk assessment considerations.

Enhanced bio techniques were evaluated in the first, third, and fourth pilot studies, which targeted the contaminants present in groundwater within the sand unit at OU4. A combined injection of an extended life organic substrate (bio-augmentation to promote bacterial growth) combined with dehalococcoides was tested to stimulate biodegradation in the sand unit.

The enhanced bio performed well because the sand unit at OU4 is conducive to a broader and more consistent spread of injectants**.** In fact, during multiple pilot studies, Ameren enhanced the naturally occurring processes by adding naturally occurring dehalococcoides in the areas of highest groundwater impact. Resulting reductions in groundwater contaminant concentrations are being tracked using quarterly sampling of monitoring wells in and adjacent to the impacted groundwater area. The COC concentrations have been greatly reduced and the majority of monitoring wells are now below the MCLs for all COCs.

In 2014 a GETS was installed at the north end of the Substation property and inside the flood berm. The GETS is comprised of three extraction wells with one inside and two outside the bermed area, and an air stripper housed in an aboveground structure. Groundwater from the extraction wells is pumped through the air stripper to remove VOCs prior to surface discharge.

The three extraction wells are screened at 35-45 feet bgs and can operate at a combined rate of approximately 62 gallons/minute. The current groundwater extraction rate is 16 gallons/minute. Groundwater flow moves through the shallow aquifer at a hydraulic conductivity rate of approximately 30 feet per day.

This alternative has already been implemented during pilot studies at the Site and has reduced the size of the groundwater plume to a small area within the Substation. All groundwater north of the Substation is below MCLs for all site COCs. Biomass has been injected downgradient from Transformer 2, creating an attenuation zone that reduces COCs as groundwater passes through the zone. The GETS should be placed in standby mode because the biomass has spread and is being collected on filter screens within the GETS. Continued water extraction could dissipate the biomass, thereby undermining ongoing groundwater treatment. The GETS would remain at OU4 but be placed in standby mode. Ongoing monitoring can be focused on biomass application areas to confirm ongoing degradation and evaluate potential for augmentation if necessary. Under this alternative, the GETS would be restarted under the circumstances described below. Periodic inspection and maintenance of the GETS may be necessary to keep the system operational.

Engineering controls such as site or area berms and fencing are included with this alternative and can control exposure pathways. To ensure that public access to OU4 remains restricted, security measures have been taken at OU4 to include fencing, locked gates, restricted access to approved personnel, digging restrictions and soil management and disposal practices.

ICs are also included in this alternative and can control exposure pathways. Ameren will execute and file with the Recorder of Deeds Office an environmental covenant, or other equivalent proprietary control, prohibiting the installation of potable water wells and soil excavations greater than 10 feet, without prior notification to and approval by the EPA and the state.

This alternative is retained. Under this alternative, the GETS will initially be placed in stand-by status. However, if the MCL is exceeded for one event for any COC outside of the Substation or there is an increasing Mann-Kendall[1] trend inside the Substation for four consecutive quarters a remedial action of restarting the GETS, ISCO or enhanced bio, or a combination of the three will be implemented. The GETS and/or enhanced bio would continue to be implemented until the groundwater COCs show a declining Mann-Kendall trend for four consecutive quarters.

Cost per Application	$35,000 Bio $75,000 ISCO
GETS Annual O&M	$130,000
Annual Groundwater Monitoring	$100,000
Annual Present Worth Cost	$340,000
Time to Meet RAOs	<10 years

Alternative 3 – Enhanced Bio, GETS, and ICs

This alternative is the same as Alternative 2, except that it does not include ISCO injections.
This alternative has already been implemented during pilot studies and has reduced the size of the groundwater plume to a small area within the Substation. All groundwater north of the Substation is below MCLs for all site COCs. Biomass has been injected downgradient from Transformer 2, creating an attenuation zone that reduces COCs as groundwater passes through the zone. The GETS should be placed in standby mode because the biomass has spread and is being collected on filter screens within the GETS. Continued water extraction could dissipate the biomass, thereby undermining ongoing groundwater treatment. The GETS would remain at OU4 but be placed in standby mode. Ongoing monitoring can be focused on biomass application areas to confirm ongoing degradation and evaluate potential for augmentation if necessary. Under this alternative, the GETS would be restarted under the circumstances described below. Periodic inspection and maintenance of the GETS may be necessary to keep the system operational.

Engineering controls such as site or area berms and fencing are included with this alternative and can control exposure pathways. To ensure that public access to OU4 remains restricted, security measures

[1] The Mann-Kendall Trend Test is used to analyze data collected over time for consistently increasing or decreasing trends.

have been taken at OU4 to include fencing, locked gates, restricted access to approved personnel, digging restrictions and soil management and disposal practices.

ICs are also included in this alternative and can control exposure pathways. Ameren will execute and file with the Recorder of Deeds Office an environmental covenant, or other equivalent proprietary control, prohibiting the installation of potable water wells and soil excavations greater than 10 feet, without prior notification to and approval by the EPA and the state.

This alternative is retained. Under this alternative, the GETS will initially be placed in stand-by status. However, if the MCL is exceeded for one event for any COC outside of the substation or there is an increasing Mann-Kendall trend inside the Substation for four consecutive quarters a remedial action of restarting the GETS, or enhanced bio, or a combination of the two will be implemented. The GETS and/or enhanced bio would continue to be implemented until the groundwater COCs show a declining Mann-Kendall trend for four consecutive quarters.

Bio per Application	$35,000
GETS Annual O&M Cost	$130,000
Annual Groundwater Monitoring	$100,000
Annual Present Worth Cost	$265,000
Time to Meet RAOs	<10 years

EVALUATION OF ALTERNATIVES

In accordance with the NCP, nine criteria are used to evaluate the different remediation alternatives individually and against each other to select a remedy. This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. The detailed analysis of alternatives can be found in the March 2020 Final Feasibility Study.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES
Threshold Criteria:
Overall Protectiveness of Human Health and the Environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
Compliance with Applicable and Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.
Primary Balancing Criteria:
Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
Modifying Criteria:
State/Support Agency Acceptance considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

Community Acceptance considers whether the local community agrees with the EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

This section presents a justification for the selection or dismissal of remedial action alternatives utilizing the above methodology. A description of the screening evaluation is included in the following subsections.

THRESHOLD CRITERIA: These criteria must be met for an alternative to be considered**.**

1. Overall Protection of Human Health and the Environment

Alternative 1 would not protect human health and the environment from the contamination in the groundwater at OU4. Since no action would be conducted under Alternative 1, the potential for exposure to the contaminants left on Site would exist if further use, development, or re-zoning of the Substation property occurred.

Alternatives 2 and 3 would be protective of human health and the environment because groundwater contaminants that exceed MCLs would be removed.

2. Compliance with ARARs

Alternative 1 does not comply with chemical-specific ARARs. Since Alternative 1 does not meet the threshold criteria, it will no longer be carried through the analysis of all nine criteria.

Alternatives 2 and 3 would comply with chemical-specific ARARs and action-specific ARARs.

PRIMARY BALANCING CRITERIA: These are primary criteria against which the alternatives are evaluated.

3. Long-term Effectiveness and Permanence

Alternatives 2 and 3 would remove contaminants from groundwater and eliminate residual risk at OU4.

4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment

Alternatives 2 and 3 would reduce the toxicity, mobility, or volume of on-site contaminants over time. The potential for exposure during the attenuation processes would be evaluated through groundwater monitoring. Alternatives 2 and 3 could involve treatment of contaminated groundwater, thus meeting the statutory preference for treatment as a principal element; hence, reducing mobility, toxicity, and volume of contaminants.

5. Short-term Effectiveness

Alternative 2 and 3 will take approximately 10 years to reach cleanup goals.

6. Implementability

Alternatives 2 and 3 have remedies that have previously been implemented at the site as pilot studies. The remedies are technically and administratively easy to implement.

7. Costs

Cost comparisons for the Alternatives are included in this subsection. The estimates are approximate and made without detailed engineering data. Cost estimates involve approximation, assumptions, estimations, interpretation, and engineering judgment. The actual cost of the project would depend on the final scope of the remedial actions and other factors presently unknown.

The estimated annual total present worth cost for Alternatives 2 and 3 are:

<u>Alternative 2</u>

O&M Cost –

- Bio-augmentation – $35,000/application
- Chemical oxidation – $75,000/application
- Monitoring/Sampling – $100,000.00
- Restart of GETS, if necessary, $10,000 plus $120,000/year
- Total Present Worth Cost – $340,000

Alternative 3

O&M Cost –

- Bio-Augmentation – $35,000/application
- Monitoring/Sampling – $100,000.00
- Restart of GETS, if necessary, $10,000 plus $120,000/year
- Total Present Worth Cost – $265,000

MODIFYING CRITERIA: These criteria evaluate acceptance of the alternatives by the state of Missouri and the public.

8. State Agency Acceptance

State acceptance of the alternatives will be fully determined after the public comment period closes for this Proposed Plan.

9. Community Acceptance

Community acceptance of the alternatives will be fully determined after the public comment period closes for this Proposed Plan.

SUMMARY OF PREFERRED ALTERNATIVE

The EPA recommends that Alternative 3 be selected to achieve the RAOs for OU4 because pilot studies have already shown the GETS and enhanced bio to be viable technologies to remove chlorinated solvents from groundwater. Alternative 3 will also continue to achieve substantial risk reduction by both treating the source area under Transformer 2 and providing safe management of remaining material. Based upon results obtained thus far from various pilot studies and confirmed by the most recent September 2020 sampling event, COCs at OU4 have responded to treatment applications and continue to degrade. Compliance with federal drinking water MCLs for the COCs is achievable within an acceptable remedial timeframe.

All off-site monitoring wells (PZ 1-12) and approximately half of 17 Substation monitoring wells already satisfy the RAO criteria.

- As reflected in monthly National Pollutant Discharge Elimination System sampling, influent concentrations into the GETS (MW 5) of *cis*-DCE are well below the MCL and VC is at 3.8 µg/L (MCL is 2.0 µg/L).
- Biomass has been injected downgradient from Transformer 2, creating an attenuation zone that reduces COCs as groundwater passes through the zone.
- The GETS should be placed in standby mode because the biomass has spread and is being collected on filter screens within the GETS. Continued water extraction could dissipate the biomass, thereby undermining ongoing groundwater treatment. The GETS would remain at OU4 but be placed in standby mode.
- Ongoing monitoring can be focused on biomass application areas to confirm ongoing degradation and evaluate potential for augmentation if necessary. Wells demonstrating compliance with the MCLs for an extended period and no longer needed for monitoring would be removed from monitoring and abandoned in accordance with state requirements. The specific wells designated for this purpose would be identified in a groundwater monitoring plan.
- If the MCL is exceeded for one event for any COC outside of the substation or there is an increasing Mann-Kendall trend inside the Substation for four consecutive quarters a remedial action of restarting the GETS, or enhanced bio, or a combination, will be implemented. The GETS and/or enhanced bio would continue to be implemented until the groundwater COCs show a declining Mann-Kendall trend for four consecutive quarters.
- To ensure that public access to OU4 remains restricted, Ameren agrees to identify and document security measures at OU4, including fencing, locked gates, restricting access to approved personnel, digging restrictions and soil management and disposal practices.
- Ameren will execute and file with the Recorder of Deeds Office an environmental covenant, or other equivalent proprietary control, limiting the installation of potable water wells and soil excavations greater than 10 feet, without prior notification to and approval by the EPA and the state.

- Construction of buildings within the Substation will also be prohibited unless approved by the EPA and the state.

Thus, based on information currently available, the EPA believes the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The EPA expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA § 121(b): (1) be protective of human health and the environment; (2) comply with ARARs; (3) be cost-effective; and (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

COMMUNITY PARTICIPATION

The EPA provides information regarding the cleanup of the Site to the public through public meetings, the Administrative Record file for the Site, and announcements published in the *Mid-Rivers News Magazine*. The EPA encourages the public to gain a more comprehensive understanding of the Site and the Superfund activities conducted there.

Public Comment Period: February 2, 2021 – March 1, 2021: The EPA is seeking comment on all the alternatives presented in this Proposed Plan. The EPA will accept written comments on the Proposed Plan during the public comment period.

Public Meeting: The EPA will hold a public meeting to explain the Proposed Plan and the alternatives presented in the Final Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held online via Microsoft Teams on February 9, 2021, from 6:00 – 7:00 PM.

The Administrative Record file for this site is available online for anyone with an internet connection at the following website:

www.epa.gov/superfund/findettcorp
(see Site Documents & Data).

The Administrative Record file may be accessed online at the following repositories:

EPA Records Center
Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

St. Charles Public Library
77 Boone Hills Dr
Saint Peters, MO 63376
(636) 441-2300
youranswerplace.org

For further information on the Site, please contact:

Clint Sperry
Remedial Project Manager
(913) 551-7157
Email: Sperry.Clint@epa.gov

Pamela Houston
Community Involvement Coordinator
(913) 551-7699
Email: Houston.Pamela@epa.gov

GLOSSARY OF TERMS

Specialized terms used in this Proposed Plan are defined below:

Administrative Record: The body of documents that "forms the basis" for selection of a particular response at a site. An Administrative Record is available at or near the site to permit interested individuals to review the documents and to allow meaningful public participation in the remedy selection process.

Aquifer: An underground layer of rock, sand, or gravel capable of storing water within cracks and pore spaces or between grains. When water contained within an aquifer is of sufficient quantity and quality, it can be used for drinking or other purposes. The water contained in the aquifer is called groundwater.

Applicable or Relevant and Appropriate Requirements: The federal and state environmental laws that a selected remedy will meet.

Capital Costs: Expenses associated with the initial construction of a project.

Comprehensive Environmental, Response, Compensation, and Liability Act (CERCLA): The law enacted by Congress in 1980 to evaluate and cleanup abandoned, hazardous waste sites. The EPA was charged with the mission to implement and enforce CERCLA.

Consent Order: A **consent order, or ASAOC,** is generally a voluntary agreement between two or more parties to a dispute. It generally has the same effect as a court **order** and can be enforced by the court if anyone does not comply with the **orders**.

Contaminant Plume: A column of contamination with measurable horizontal and vertical dimensions that is suspended in and moves with groundwater.

Groundwater: Underground water that fills pores in soils or openings in rocks to the point of saturation. Groundwater is often used as a source of drinking water via municipal or domestic wells.

Maximum Contaminant Levels: The maximum permissible level of a contaminant in water that is delivered to any user of a public water system.

Monitoring: Ongoing collection of information about the environment that helps gauge the effectiveness of a cleanup action. Monitoring wells drilled at different levels at Operable Unit 5 would be used to detect any migration of the plume.

National Oil and Hazardous Substances Pollution Contingency Plan: The federal regulations that guide the Superfund program.

Operable Unit: Term for each of a number of separate activities undertaken as part of a Superfund site cleanup.

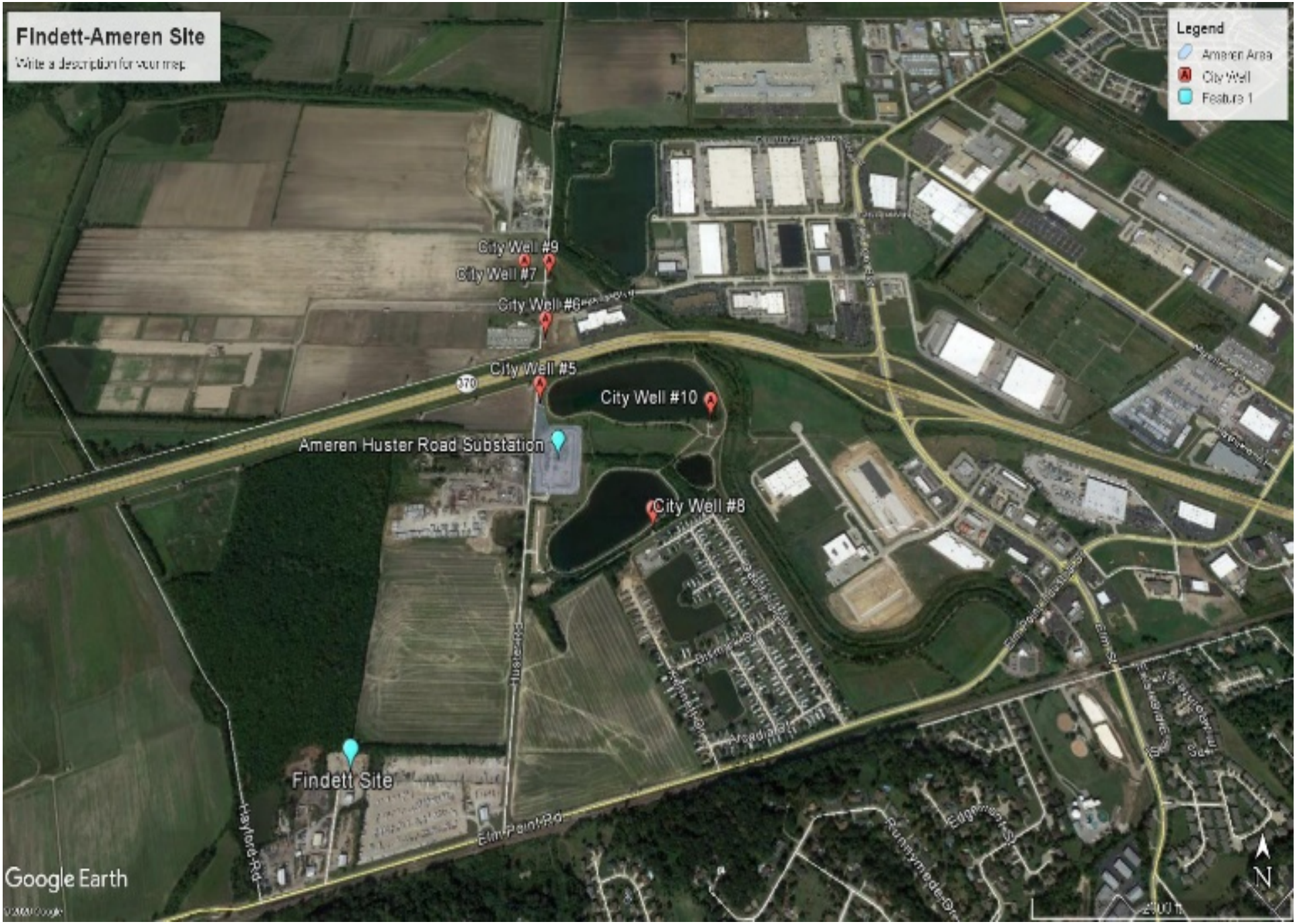
Operation and Maintenance: Activities conducted at a site after the construction phase to ensure that the cleanup continues to be effective.

Plume: A body of contaminated groundwater flowing from a specific source.

Record of Decision: The decision document in which the EPA selects the remedy for a Superfund site.

Superfund: The nickname given by the press for CERCLA because the program was well funded in the beginning.

Toxicity: A measure of degree to which a substance is harmful to human and animal life.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Legend
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City Well
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City Well #7
City Well #6
City Well #5
City Well #10
Ameren Huster Road Substation
City Well #8
Findett Site
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Hayford Rd
Elm Point Rd
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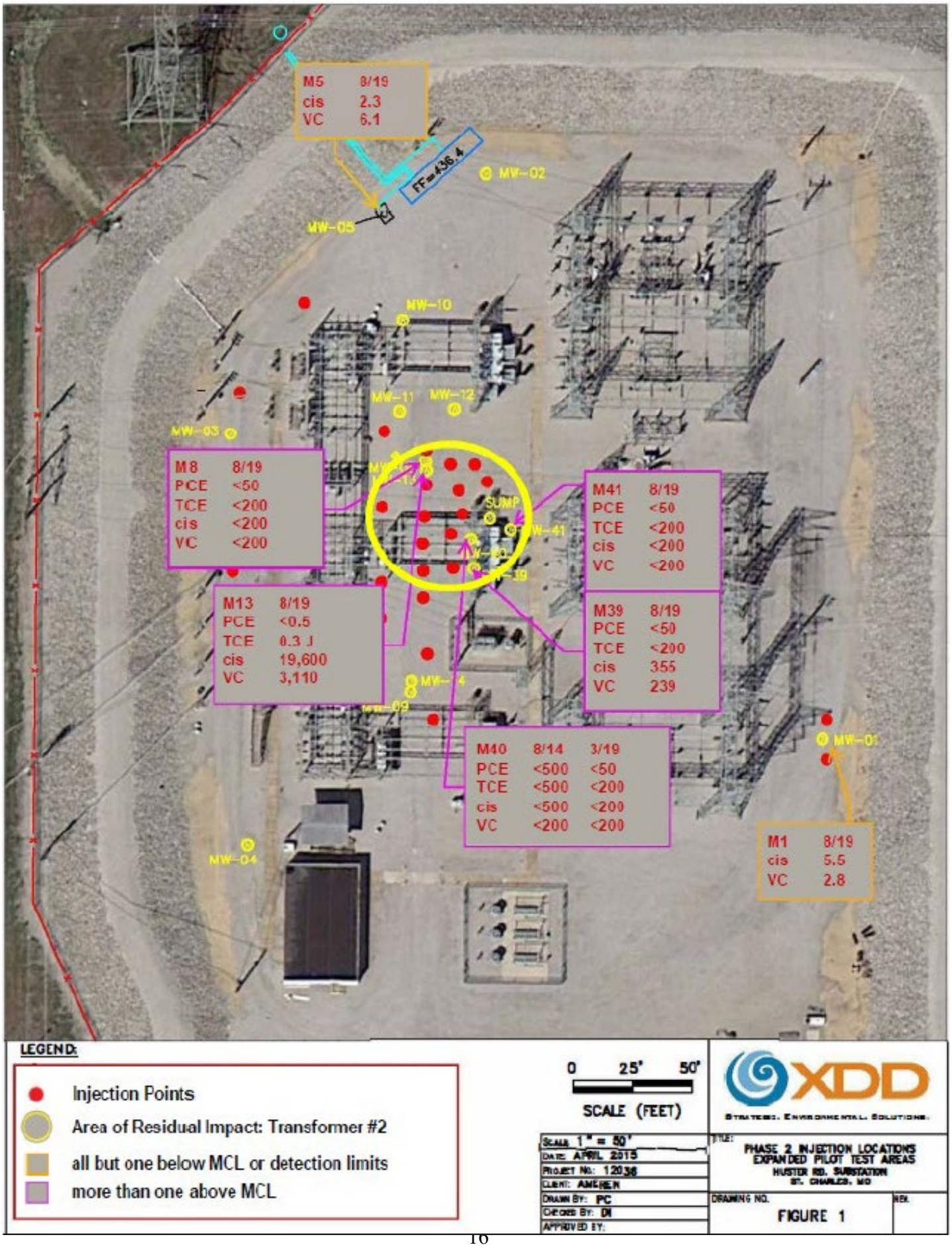
M5 8/19
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VC 6.1
FF=436.4
MW-02
MW-05
MW-10
MW-11
MW-12
MW-03
M8 8/19
PCE <50
TCE <200
cis <200
VC <200
SUMP
MW-41
M41 8/19
PCE <50
TCE <200
cis <200
VC <200
M39 8/19
PCE <50
TCE <200
cis 355
VC 239
M13 8/19
PCE <0.5
TCE 0.3 J
cis 19,600
VC 3,110
MW-09
M40 8/14 3/19
PCE <500 <50
TCE <500 <200
cis <500 <200
VC <200 <200
MW-01
MW-04
M1 8/19
cis 5.5
VC 2.8
LEGEND:
Injection Points
Area of Residual Impact: Transformer #2
all but one below MCL or detection limits
more than one above MCL
0 25' 50'
SCALE (FEET)
XDD
STRATEGIC ENVIRONMENTAL SOLUTIONS
SCALE 1" = 50'
DATE: APRIL 2015
PROJECT NO.: 120338
CLIENT: AMEREN
DRAWN BY: PC
CHECKED BY: DI
APPROVED BY:
TITLE: PHASE 2 INJECTION LOCATIONS
EXPANDED PILOT TEST AREAS
HUSTER RD. SUBSTATION
ST. CHARLES, MO
DRAWING NO.
FIGURE 1
REV.